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SYNOPSIS ENTITLED

INTEGRATED MANAGEMENT OF SEED BORNE FUNGAL DISEASES OF PIGEON PEA *[Cajanus cajan (L.) Mills]*

Submitted by

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Introduction:

Pulses have special significance in the dietary of the predominantly vegetarian population of India as they contain two to three times more protein than that in cereals. Among the pulses, pigeon pea is the 2nd major pulse crop grown in India. It is an important grain legume crop of rain filed agriculture.

Pegeon Pea *[Cajanus cajan (L.) Mills]* is being grown in tropical and subtropical parts of the world. Pigeon pea is the most importance pulses crop of India. Which the plant is perhaps native to Africa. The important pigeon pea producing countries are Africa, America, Atlanta, India and West Indies in India it is widely cultivated in UP, AP, Telangana, Tamilanadu and Maharastra. It contains 22.3% proteins 1.7% fats, 57.2% carbohydrates and 3-6% of minerals. Cajanin and concajanin are two important proteins are present in pigeon pea. It also provides some important aminoacides like methionine, lysine and tryptophan to human beings. It is a multipurpose species, is extensively used as food grain and green manure crop for soil fertility amelioration in local cropping systems. Pea leaves provide an excellent fodder. Other common names are red gram, congo pea, gunga pea and No eye pea.

Pigeon pea is an erect woody, annual (or) perennial short lived shrub or small tree, belongs to leguminosae family, 1-4 m tall with a deep tap root, young stems is angled and pubescent, and leaves trifoliate, alternate, set in a spiral around the steam. Leaflets oblong, lanceolate, petiolate, stipulate, flowers usually yellow, sometimes with purple, zygomorphic flowers, papilionaceaous corolla, didelphous stamens, fruit-legume or pod contains 3-4 seeds having white hilum at seed attachment point.

The seeds are dark chocolate red and the cotyledons are light to deep yellow in colour. The crop may be raised under rainfed conditions on a wide variety of soils, though it thrives best in sandy or clayey loam.

Seed health refers primarily to the presence are absence of the micro organisms of various kinds ISTA (1985). It has been realized time and again that seed health, a paramount

importance for crop stand and yield returns. Hence, aptly quoted “A healthy seed leads to a healthy harvest”.

Seeds are regarded as means of transporting plant pathogen (Agarwal & Sinclair 1996). Seed borne pathogen may cause seed abortion, seed rot, seed necrosis, reduction or elimination of germination capacity, as well as seedling damage (Khanzada etal 2002).

Seed mycoflora is a major fact of affecting seed health. Wide ranges of fungi have been encountered with pigeon pea seed. Although some of them have been reported to pathogenic, many other aspects of seed pathology of pigeon pea need to be understood.

Review of Literature:

Seeds are the different carriers for survival large scale and long distance spread of pathogenic organisms both externally and internally and pigeon pea seeds are not and exception. Infected or contaminated seeds prove hazardous for the seeds as they cause pre and post emergence losses and finally resulting in reduced germination of seeds, reduction of yield and also spoiled the quality of seeds during storage.

The architect of pigeon pea plant is very sturdy yet it attracts 69 fungal, 3 bacterial and 19 viral pathogens causing various diseases (nene etal 1996).

The present review deals with the work done on detection, identification, estimation of mycoflora associated with mycoflora with pigeon pea seeds and their management. Studies pertinent to pigeon pea seed health were conducted by various workers reviewed. Detail accounts of methods used in seed health evaluation was given (ISTA, 1976 and Neergaard, 1977).

Charya & Reddy (1979) detected more fungi on the logal pigeon pea variety than hybrids and found that the blotter paper method revealed more seed borne mycoflora than the agar plate method.

Kumar & Srivastava (1985) reported 17 fungal species associated with abnormal looking, wrinkled and discoloured seeds of the cultivars prabhath, T-21, T-7, and T-17.

Lokesh et al (1988) isolated five mycoflora species including *Alternaria alternata and cladosporium* from developing pigeon pea seeds.

Pandey et al (2007) detected 17 fungal species on stored seed samples of pigeon pea collected from 18 places Eastern Utter Pradesh. Among these *Aspergillus flavus* and A. Niger were predominant.

Jalander and Gachande (2011) isolate *Fusarium oxysporium*, *F. Sp. Udum* from infected roots of different varieties of pigeon pea.

Mallesh et al (2008) evaluated the efficacy of seven different antifungal compounds, bio agents, and chemicals against storage fungi.

Singh et al (2011) were evaluated eleven fungicides for seed treatment out of them Bavistin 50 WP was found most effect in seed germination.

Aims & Objectives:

1) To study the seed borne diseases of pigeon pea (*Cajanus cajan*).
2) Collection of seed samples of different varieties of pigeon pea from various regions of Telangana State
3) To assess seed mycoflora by employing various techniques as recommended by ISTA (International seed testing association).
4) Incubation of seed plate to find out the seed mycoflora of pigeon pea.
5) Identification and Isolation of seed borne pathogen.
6) To study pathogenicity of seed borne pathogen
7) To analyse the results and produce the statistical data.
8) To provide suitable control measures against seed borne pathogen of pigeon pea on the basis of obtained results.
9) To study the effect of bio control, fungicides and medicinal plants in control of seed borne pathogen.

Materials & Methods:

The following instruments may be used in the present study as per requirements.

1) Auto clave for sterilization.
2) BOD incubator for incubation.
3) Compound microscope for identification of mycoflora.
4) Hot air oven for glassware sterilization.
5) Laminar air flow for isolation & purification of mycoflora.
6) Electronic digital balance for weighing.
7) Forceps, needls, blades, knives and scalpel.
8) Spirit lamp for sterilization.
9) Microwave oven for melting of media.
10) Growth chamber.
11) Stereo – Binocular microscope for studying the habit characters.
12) Micropipette.
13) Centrifuge.

Collection of Seed samples: The methods described by neergard (1973) have been adopted for the collection of seed samples. Accordingly, seed samples (1/2 kg seeds in each sample) are to be collected from fields, store houses and market places in Telangana State. A composite sample is prepared by mixing the individual samples together, preserved in Jute bags at room temperature during the studies.

Assessment of Seed mycoflora: The seed born fungi of pigeon pea would be detected by agar plate and blotter test methods as recommended by ISTA (International Seed Testing Association-1966). The procedure of agar plate and blotter test methods was described by earlier workers (De Tempe 1970, Neergard 1973, Agarwal 1976).

Identification and isolation of seed borne fungi: The plates are to be incubated at room temperature ($27 \pm 2^{\theta}C$) for 8 days. The fungi occurring on each and every seed to be identified on the basis of sporulation and morphological characters by observing under microscope with the help of manuals. The pure culture of the identified fungi are to be prepared and maintained in PDA slants and media used to isolation studies.

Plan of work:

1st Year: - Collection of seed samples of different varieties of *cajanus cajan* from different regions of Telangana.

2nd Year:- Incubation of seed, isolation of pathogen and study of pathogencity, effect of fungicides, bio fertilizers and medicinal plants.

3rd Year:- Compilation of results and produced the statistical date of research work.

Result & Discussion:

The result of different studies conducted on pigeon pea seed health evaluation and discussion to be done and prepare statistical data. Identifying the characters of detected mycoflora.

Conclusion:

Fungicidal treatment of pigeon seeds reduce the frequency of seed borne mycroflora and thereby increase the seedling vigour.

Suggestions for future research work:

1) Seed health evaluation need to be conducted at regular intervals an all the important pigeon pea varieties.

2) For increasing the detection efficacy modification in detection methods to be done.

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